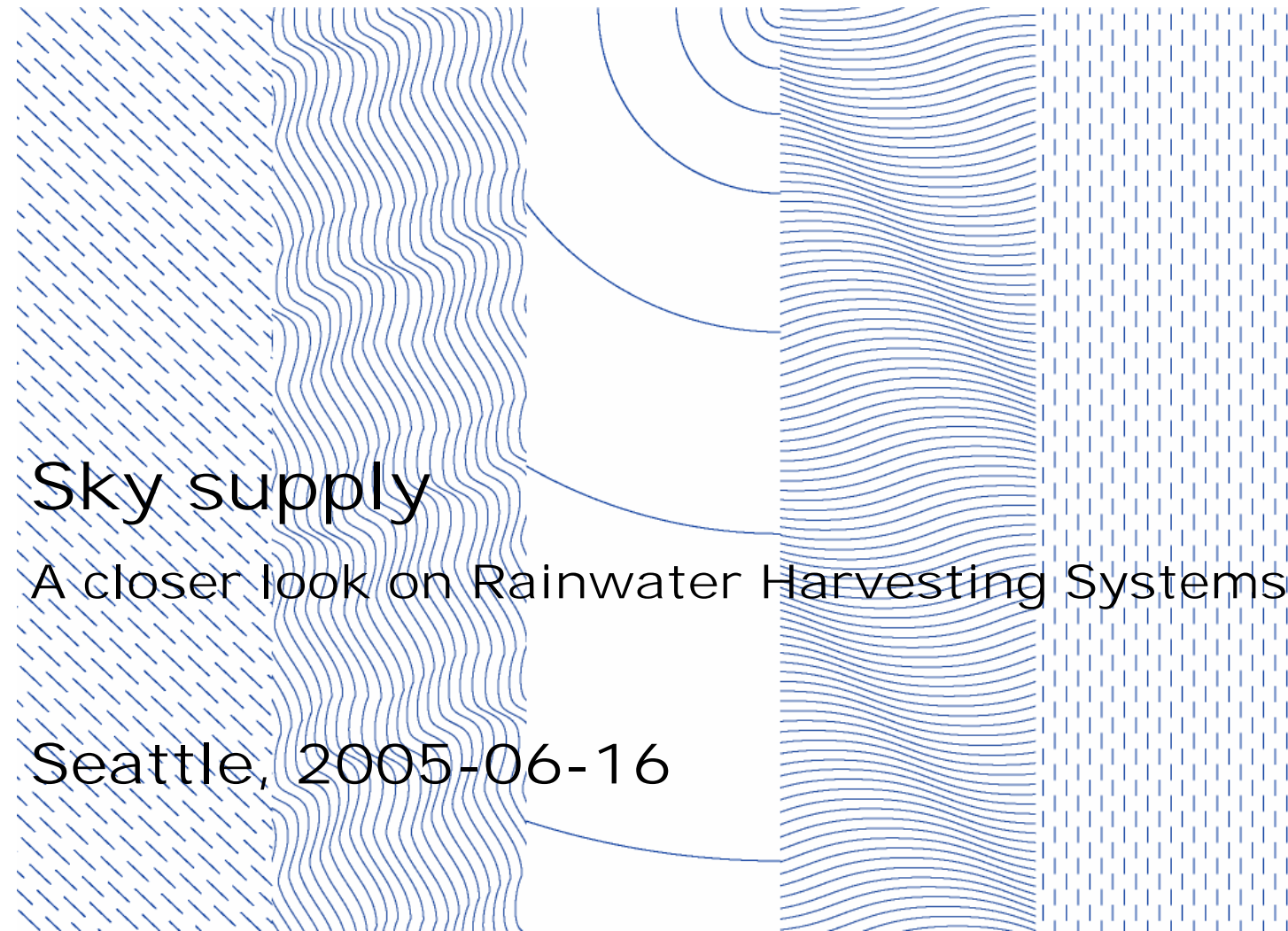


Klaus W. König



# Sky supply

A closer look on Rainwater Harvesting Systems

Seattle, 2005-06-16

## Natural Water Cycle

Lake of Constance, Germany: Swimming areas and potable water supply!  
Optimizing sewage plants and starting stormwater management



[www.klauswkoenig.com](http://www.klauswkoenig.com)



# Natural Water Cycle

Quality problems  
from mixed sewer overflow into the lake



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# Natural Water Cycle

## Quantity Problems

from stormwater runoff, if using only centralized structures:



- Damage by urban flooding
- Extreme changes in natural water cycle
- High cost for large dimensions of linear drainage and sewage structures
- No re-use of rainwater on site, no saving of potable water



# Stormwater management

## Dormitories at Salem College, Überlingen



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- Planted roofs
- Infiltration swales

Positive effects:

Evaporation, improving  
air quality  
Groundwater recharge

New:

Architectural design

# Stormwater management

Parking at Salem College, Überlingen



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- Permeable surface
- open drains

Positive effects:

Infiltration  
Evaporation

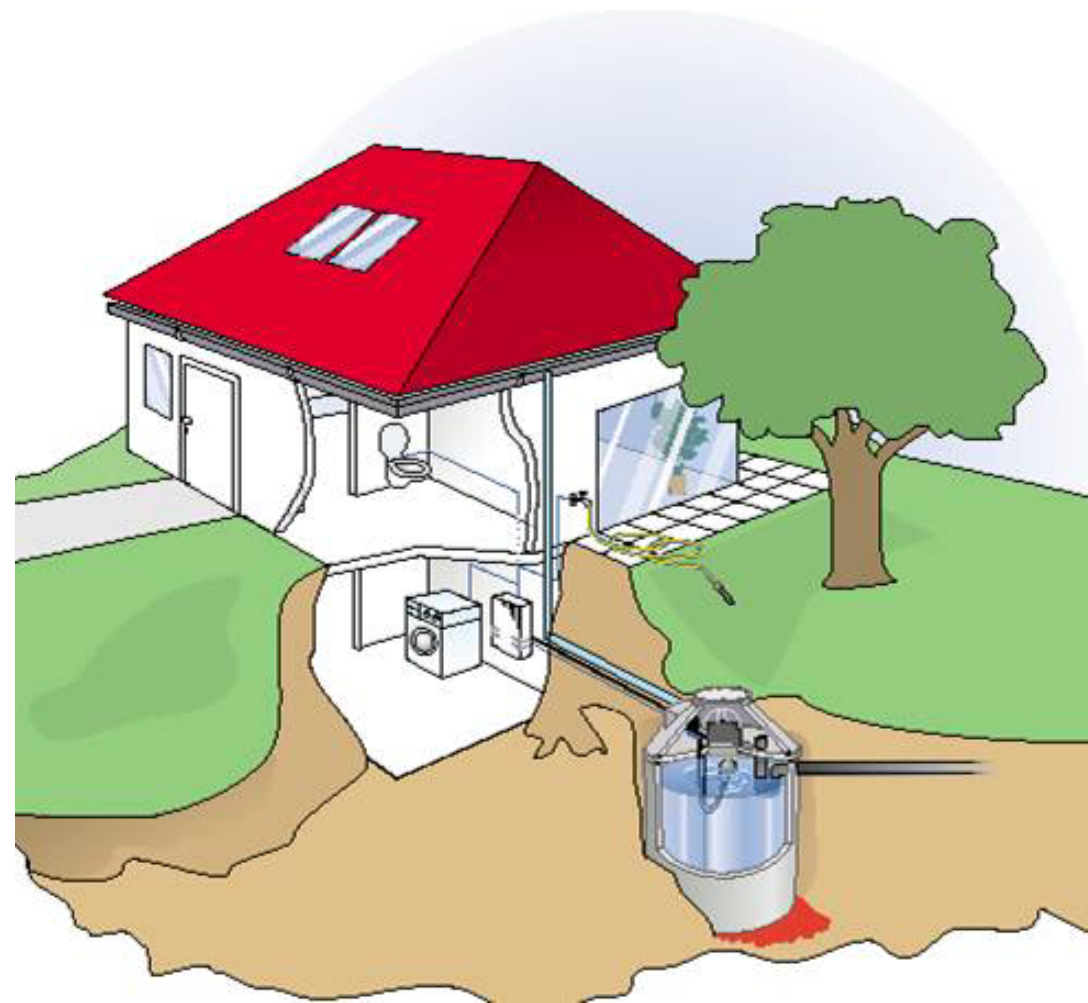
New:

Landscape design



# Stormwater management

## Rainwater utilization in detached houses

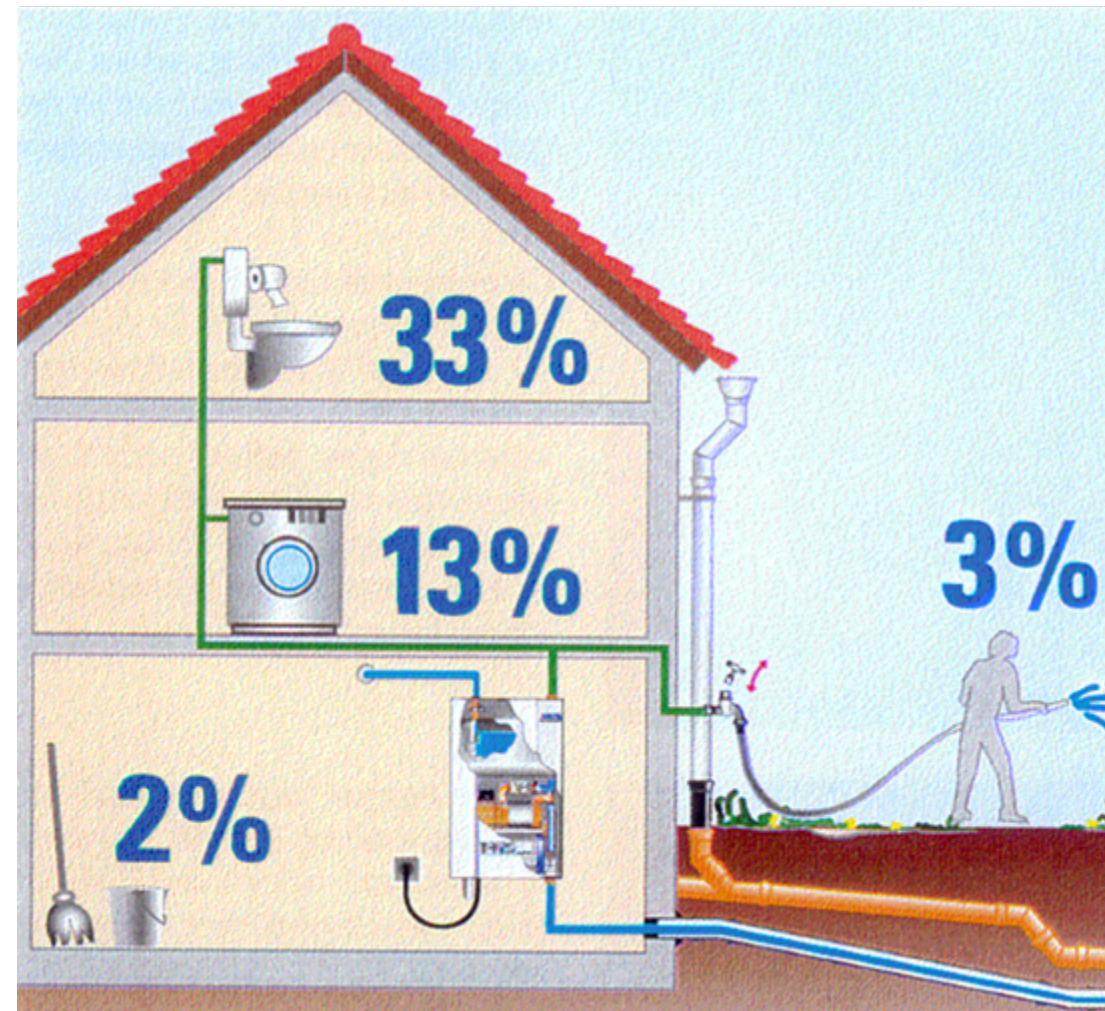


Applications:

- Irrigation
- Flushing toilets
- Laundry

# Stormwater management

## Rainwater utilization in detached houses



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Substitution of potable water:

Max. 51 %

if the size of the roof and tank is big enough

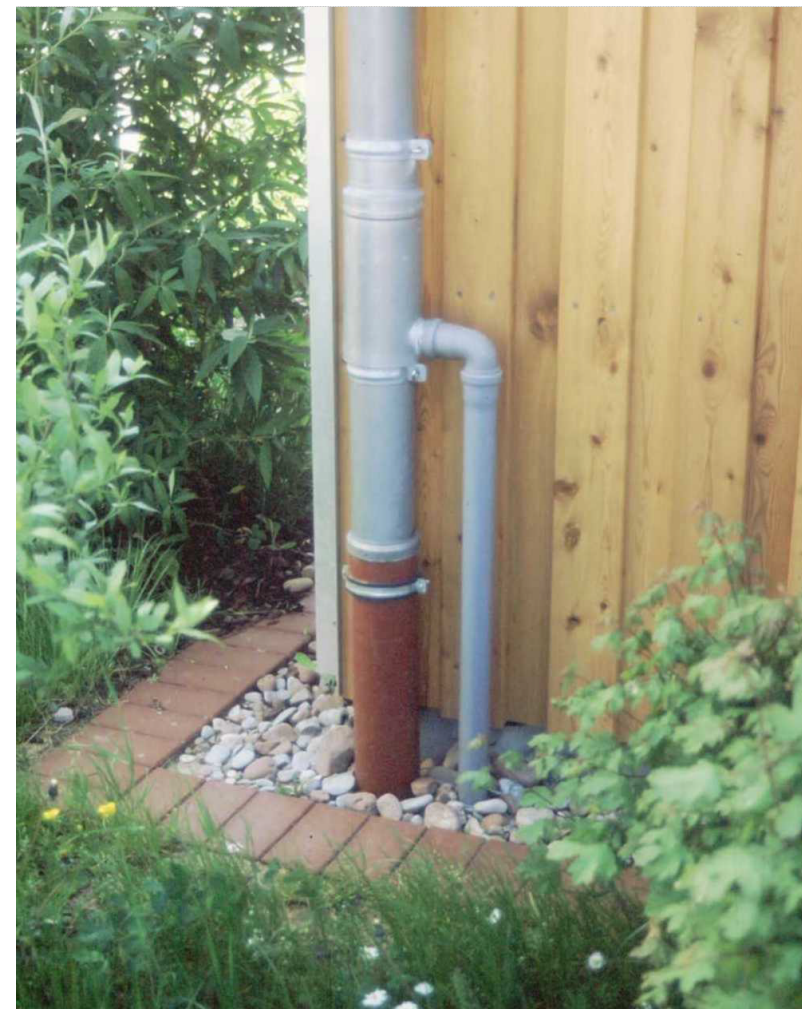
German experience:

Per person min.

- Roof 30 m<sup>2</sup>
- Tank 1.5 m<sup>3</sup>



## Water Quality Filter

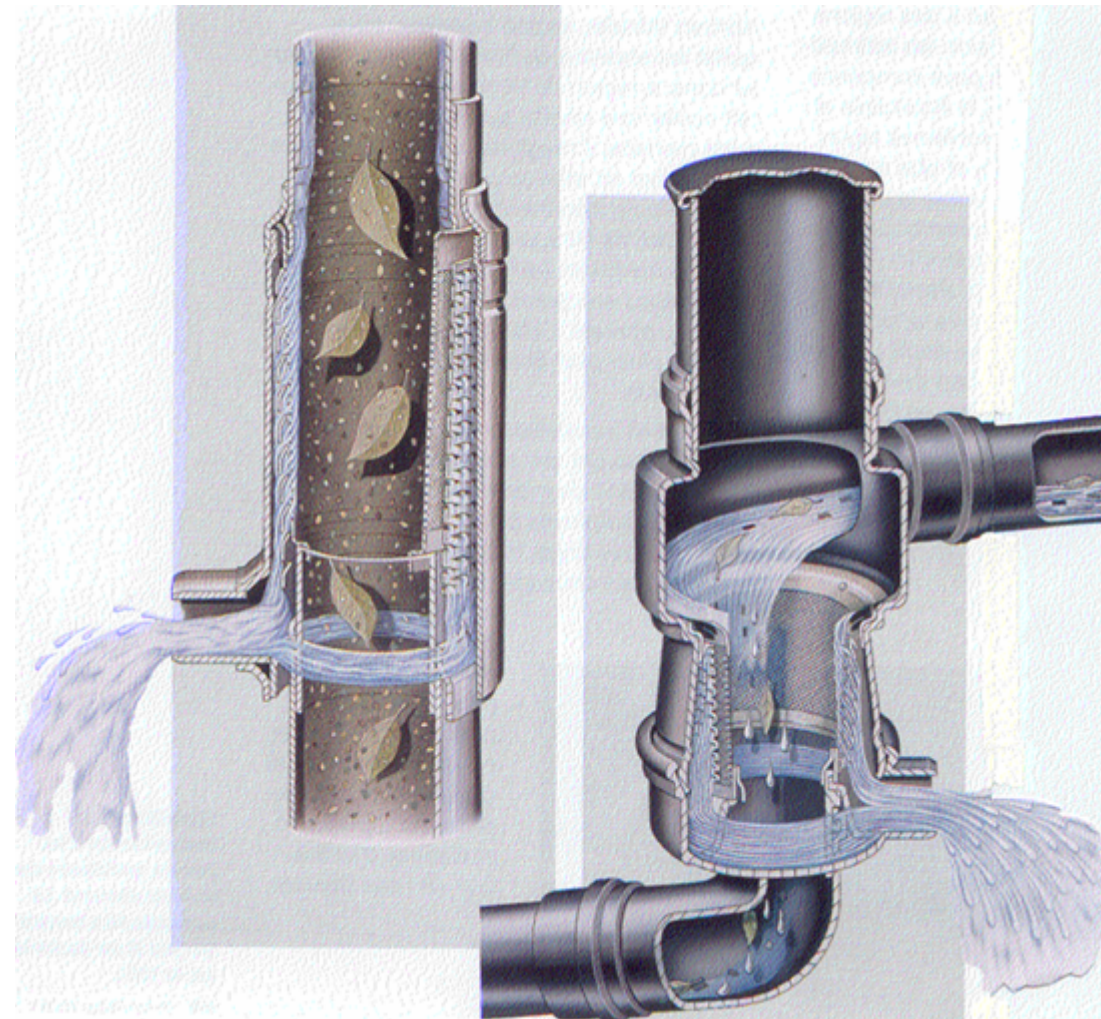


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German Vortex filter  
Patented system of cleaning

- Downpipe keeping full diameter
- Application for new and existing downpipes
- Long version to hide section with small pipe leading to the tank

## Water Quality Filter



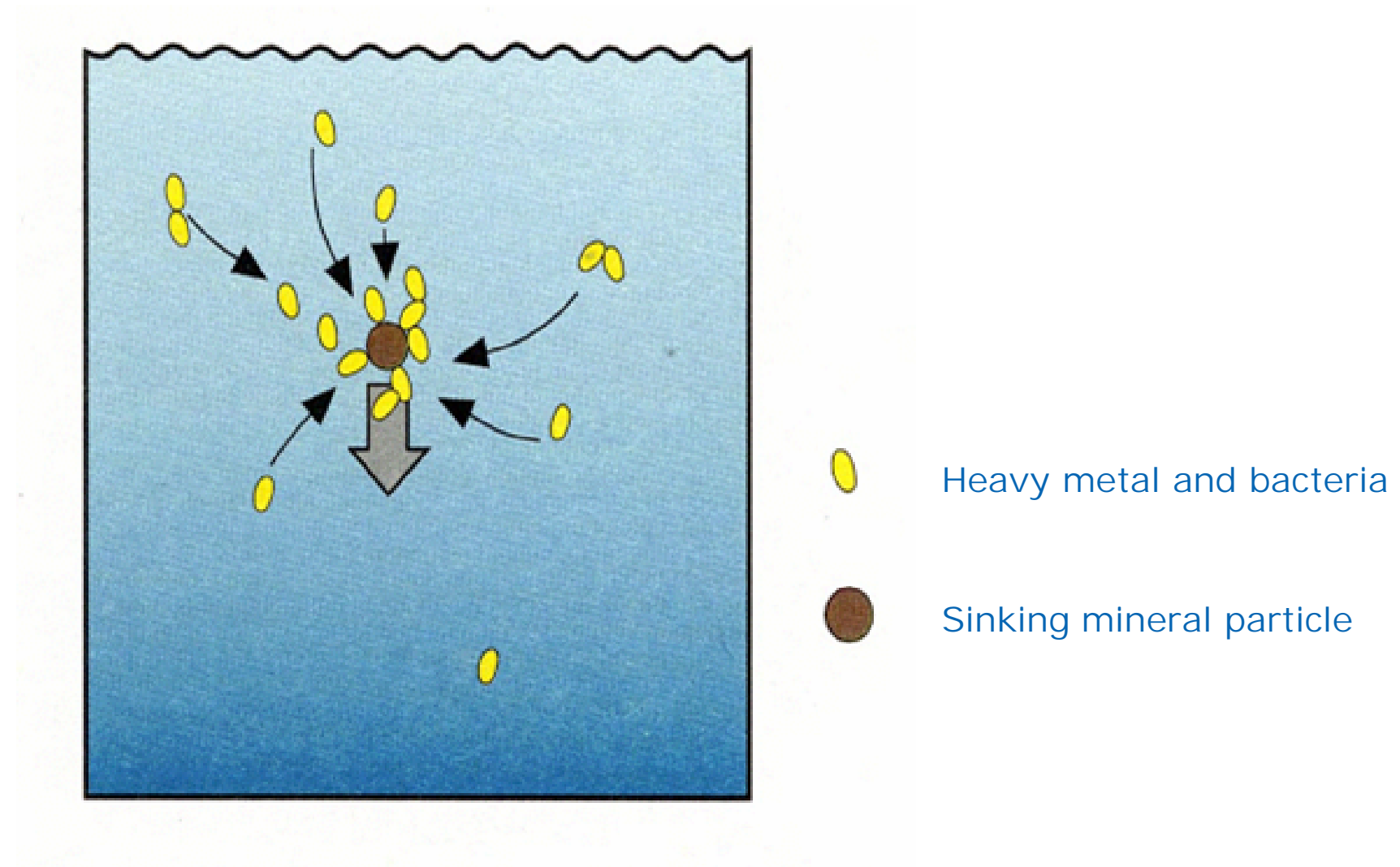
German Vortex filter

- for downpipe and groundpipe
- Different sizes
- Plug in filter inlet
- Worldwide availability



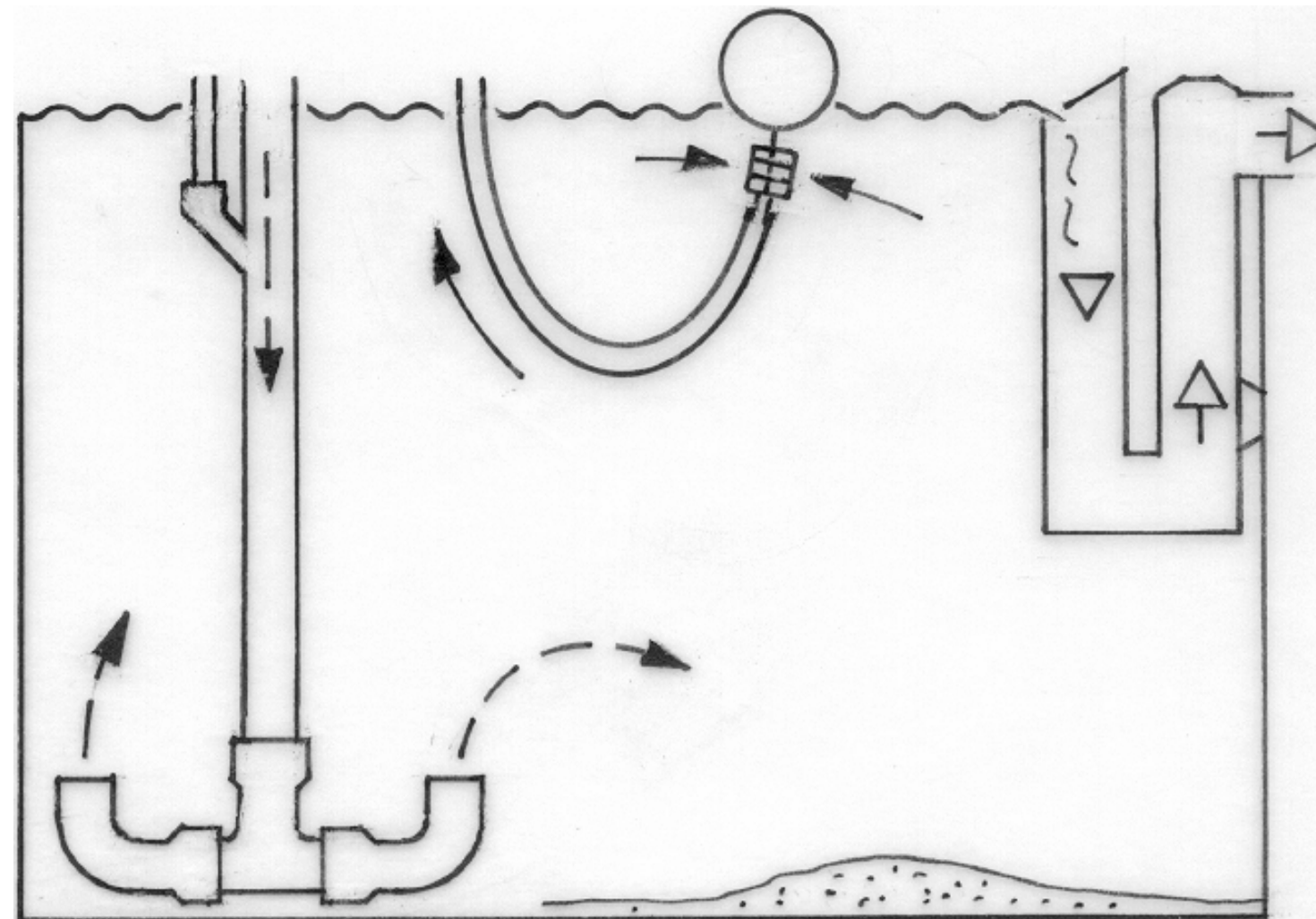
## Water Quality

Improving by self processing sedimentation in water tanks



## Water Quality

Improving by tank installation of calm inlet, floating suction, overflow syphon and sewer backflow prevention





## Water Quality

German DIN states: no problem for laundry  
if sedimentation and tank installation is in accordance with DIN 1989



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## Regulations

By German national law mandatory  
in accordance with DIN 1989 and German water supply statutes:



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1. Mains water backup  
only by free outlet  
to ensure that the individual  
rainwater system cannot have  
an effect on the public water  
network
  - 20 mm air gap
  - No cross-connections



## Regulations

By German national law mandatory  
in accordance with DIN 1989 and German water supply statutes:



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2.  
Labeling the rainwater  
distribution pipes

## Regulations

By German national law mandatory  
in accordance with DIN 1989 and German water supply statutes:



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3. Labeling the rainwater serving valves
4. The customer must notify the public health office and the water supplier prior to the installation





## Conclusion

Improving Rainwater Quality for re-use can be done by simple technology of

- Filter
- Sedimentation
- Calm Inlet
- Floating suction
- Overflow syphon
- Sewer backflow prevention

all inclusive in a tank in accordance with DIN 1989

Operation and maintenance are simple and easy, with low cost.

Klaus W. König

Thank you very much for your attention!

For more information in German, English, French see  
[www.klauswkoenig.com](http://www.klauswkoenig.com)

